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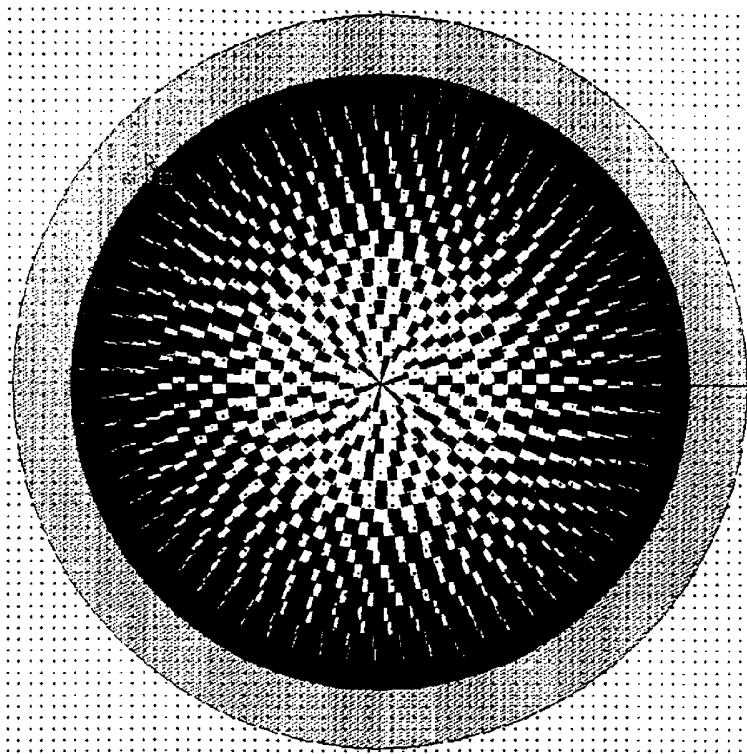
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- (71) Applicant (for all designated States except US): PHOTRONICS, INC. [US/US]; 15 Secor Road, P.O. Box 5226, Brookfield, CT 06804 (US).
- (72) Inventors: PROGLER, Christopher, J.; 601 Millenium Drive, Allen, TX 75013 (US). RHYINS, Peter; 601 Millenium Drive, Allen, TX 75013 (US).
- (74) Agents: LO CICERO, Anthony, F. et al.; Amster, Rothstein & Ebenstein LLP, 90 Park Avenue, New York, NY 10016 (US).
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[Continued on next page]

(54) Title: BINARY HALF TONE PHOTOMASKS AND MICROSCOPIC THREE-DIMENSIONAL DEVICES AND METHOD OF FABRICATING THE SAME



(57) Abstract: The present invention generally relates to improved binary half tone ("BHT") photomasks and microscopic three-dimensional structures (e.g., MEMS, micro-optics, photonics, micro-structures and other three-dimensional, microscopic devices) made from such BHT photomasks (See Fig. 13). More particularly, the present invention provides a method for designing a BHT photomask layout, transferring the layout to a BHT photomask and fabricating three-dimensional microscopic structures using the BHT photomask designed by the method of the present invention. In this regard, the method of designing a BHT photomask layout comprises the steps of generating at least two pixels, dividing each of the pixels into sub-pixels having a variable length in a first axis and fixed length in a second axis, and arraying the pixels to form a pattern for transmitting light through the pixels so as to form a continuous tone, aerial light image. The sub-pixels' area should be smaller than the minimum resolution of an optical system of an exposure tool with which the binary half tone photomask is intended to be used. By using this method,

it is possible to design a BHT photomask to have continuous gray levels such that the change in light intensity between each gray level is both finite and linear. As a result, when this BHT photomask is used to make a three-dimensional microscopic structure, it is possible to produce a smoother and more linear profile on the object being made.

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